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PACIFIC TELESIS
Group-Washington

EX PARTE

February 17, 1994

William F. Caton, Acting Secretary
Federal Communications Commission
1919 M Street, N.W. - Room 222
Washington, D.C. 20554

Re: GEN. Docket No. 90-314, Personal Communications Services

Dear Mr. Caton:

On February 17, 1994, Steve Sidore and Taher Farkhondeh of Pacific Bell and the undersigned met with Myron Peck, Mobile Services Division, Common Carrier Bureau, and with Tom Stanley, Chief Engineer, and members of his staff regarding the 100 watt maximum power level adopted by the Commission for PCS systems. The views expressed were those in Pacific Bell's petition for reconsideration, filed December 8, 1993. In addition, we distributed the attached written material.

I am filing two copies of this letter and its attachment in accordance with Section 1.1206(a) of the Commission's rules. Please contact me if you have any questions concerning this matter.

Sincerely,

William F. Adler

Attachment

CC: Tom Stanley
Myron Peck

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Personal Communications Services

Bringing Mobility to the Mass Market

February 16, 1994

Power Levels

PCS OPERATORS WILL ENCOUNTER ADDITIONAL LOSSES RELATED TO PROPAGATION AT THE HIGHER OPERATING FREQUENCIES.

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- The Okumura-Hata model is used to quantify these losses.

  $$A = 26.16 \text{ Log } (F1) - 26.16 \text{ Log } (F2) \text{ dB}$$

  Where:

  A is the additional loss at the higher operating frequencies

  F1 is the PCS Operating frequency (e.g., 2025 MHz)

  F2 is the analog Cellular Operating Frequency (e.g., 859MHz)

  A = 9.74 dB

- For simplicity, 9dB is the additional loss due to the PCS higher operating frequencies.

THE LOW POWER LIMIT WILL REQUIRE MANY MORE CELLS THAN OTHERWISE NECESSARY TO PROVIDE A COMPETITIVE SERVICE AND TO MEET BUILD-OUT REQUIREMENTS.

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- **Effects of additional loss based on Link Budget Analyses:**

Cell Radius (miles)

	Indoor Suburban	Suburban	Urban
PCS System	1.8	3.5	1
Cellular Systems	3.5	6.8	2.7

Number of Cells Required

	In-Building Suburban	Suburban	Urban
PCS System	43	12	8
Cellular Systems	11	3	1

Coverage: Suburban, 360 sq. mi.; Urban, 18.7 sq. mi.

- **Assumptions**
  - Indoor and Outdoor Suburban RF Propagation Analyses: Hata Model
  - Urban Propagation Analyses: COST 231 Walfish - Ikegami
  - Antenna Height: 150 feet
  - Additional Loss for Indoor Suburban: 10 dB

LINK BUDGET ANALYSES

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Receiving end:		BTS	MS
Noise Figure	dB	7	11
Ec/No min., fading	dB	9	9
Noise bandwidth	dB	54	54
RX RF-input sensitivity	dBm	-104	-100
Interference degrad margin	dB	3	3
In Building Penetration Loss	dB	0	0
Cable loss + Connector	dB	2	0
Rx antenna gain	dBi	11	3
Frequency hopping gain	dB	2.5	2.5
Diversity gain	dB	5	0
Isotropic power, 50% Ps	dBm	-117.5	-102.5
Lognormal margin 50% ->75%	dB	5	5
Isotropic Power, 75% Ps		-112.5	-97.5

Transmitting end:		MS	BTS
TX PA output peak power	W	-	15.85
mean power output burst	dBm	-	42
Isolator + Combiner + Filter	dB	0	3
RF peak pow., (Ant. connector)	dBm	30	39
RF peak pow., (Ant. connector)	W	1	7.94
Cable loss + connector	dB	0	2
TX antenna gain	dBi	3	11
" "	dBm	33	48
Peak EIRP	W	2	63.1
Isotropic path loss, 50% Ps	dB	150.5	150.5
Isotropic path loss, 75% Ps	dB	145.5	145.5

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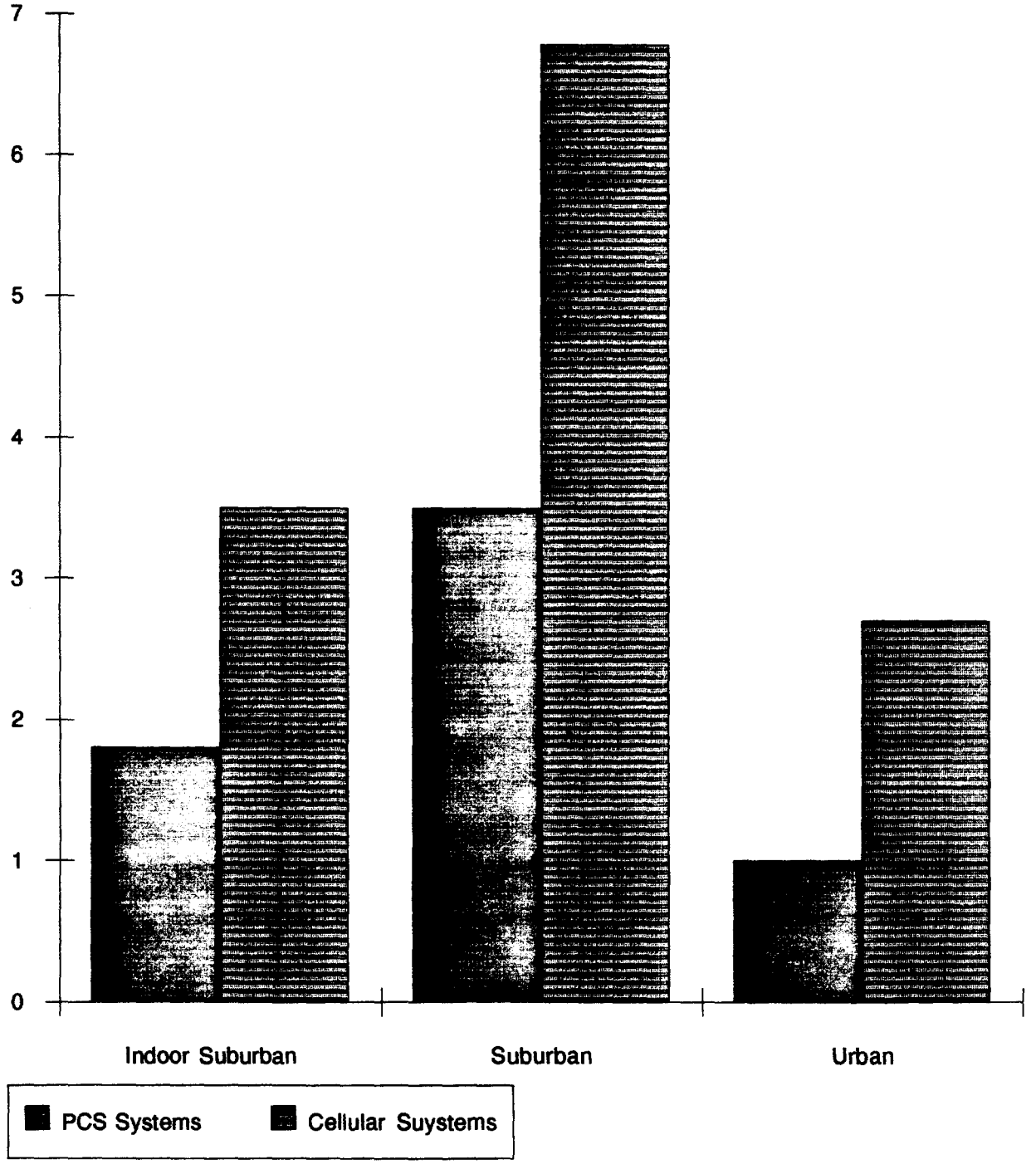
PCS & Cellular Cell Radius



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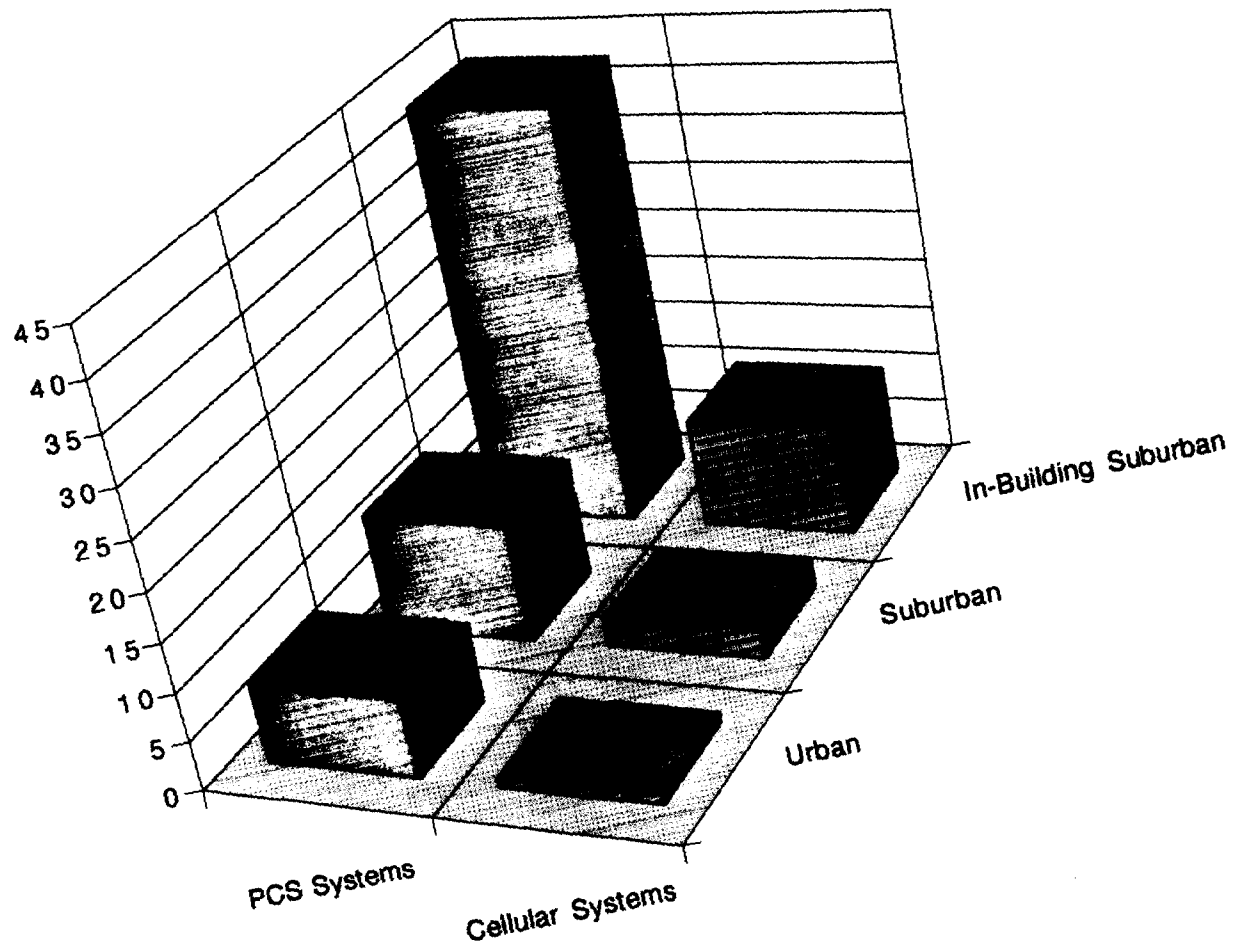
Number of Cells Required



REQUIRED POWER INCREASE BASED ON: LINK BUDGET, COVERAGE AND COST ANALYSES

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Conclusions

- **The Maximum Power of an Analog Cellular System: 500 W ERP**
- **The Equivalent of This Power for PCS, Considerating Additional Loss: 2500 W EIRP.**